CERTIFICATE OF EXPRESS MAILING

Applicant: Gregory A. Lyon

Title: CONNECTOR RECEPTACLE

Docket No.: 33778

"Express Mail" mailing label number EL653125264US

Date of Deposit January 2, 2002

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. § 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Amanda Wittine

Printed Name of Person Mailing Paper or Fee

Amanda Wittine

Signature of Person Mailing Paper or Fee

CONNECTOR RECEPTACLE

BACKGROUND OF THE INVENTION

This invention relates generally to a connector receptacle and more particularly, to a connector receptacle constructed from a polymer-based material coated with a conductive material that is used for connecting fiber optic cables into a receiving member, such as an electrical cabinet. It is well known to those skilled in the art that problems can occur when fiber optic cables are connected into their appropriate location in such cabinets. Excessive bending or twisting of the fiber optic cable can cause damage to the hair-thin fibers inside the optic cable and attenuation of the optical signal in the fiber.

In addition, electronic circuitry is often operationally degraded by electromagnetic interference, hereinafter referred to as EMI. The lack of adequate shielding may allow EMI from an external source to affect such electronic circuitry and may allow this circuitry to contaminate the surrounding area with EMI.

It is therefore desirable to provide a receptacle that easily and securely receives a fiber optic coupler containing a fiber optic cable that limits the bend radius of the cable once it has been connected to the coupler in the receptacle. Furthermore, it is desirable to attenuate external EMI penetrating the receptacle, and thus, reduce the magnitude of the EMI energy which couples to and degrades the electronic circuitry.

SUMMARY OF THE INVENTION

The invention provides a receptacle for a plurality of optical connectors. The receptacle may be a receiving housing having a plurality of surfaces for mounting the housing to a receiving member having first and second faces. The connector receiving housing has a

cavity therein and one or more passages adjacent to the cavity for receiving the optic cable connectors. A protrusion on the connector receiving housing engages the first face of the receiving member; and a lip on the connector receiving housing engages the second face of the receiving member. The housing is mounted to the receiving member by the interaction of the lip and the protrusion.

It is one aspect of this invention to provide a receptacle for a fiber optic cable connector having a plurality of optical fibers. The receptacle comprising a polycarbonate connector receiving housing having a cavity therein for receiving the fiber optic cable connector and one or more passages through the cavity. The housing having a plurality of surfaces including front, right side and left side, the plurality of surfaces and the cavity being coated with a conductive material. The housing also having a protrusion on each of the right and left side surfaces, each protrusion ending with an edge, the protrusion permits the housing to slide through the receiving member and a lip around the front side surface of the housing, whereby the housing is secured into the opening in the receiving member by the interaction of the lip around the front side surface and the edge on the protrusion.

In accordance with another aspect of this invention, it is further desirable to provide an electrical component assembly comprising an electrical cabinet having a faceplate with first and second faces, a cable connector connected to the electrical cabinet and having a coupler with a plurality of optical fibers plugged into each side of the coupler and a polycarbonate connector receiving housing having a cavity therein for receiving the connector and one or more passages through the cavity, the housing having a plurality of surfaces coated with a conductive material. The housing having a protrusion on each of the right and left side surfaces, each protrusion defining an edge, the protrusion permits the housing to slide through the faceplate. A lip at an edge of the housing,

whereby the housing is secured into the opening in the faceplate by the interaction of the lip and the edge on the protrusion.

These and other aspects of this invention are illustrated in the accompanying drawings, and are more fully disclosed in the following specification.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a prior art sheet metal receptacle in a receiving member;

FIG. 2 is a exploded perspective view of the receptacle embodying the invention and illustrating the interconnection of the receptacle self fastened into the receiving member and an accompanying fiber optic cable connector;

FIG. 3 is a perspective view of the receptacle embodying the invention;

FIG. 4 is a side view of the receptacle embodying the invention;

FIG. 4A is an exploded view of the protrusion on a side surface of the receptacle embodying the invention; and

FIG. 5 is a top view of the receptacle embodying the invention.

DESCRIPTION OF THE INVENTION

Referring to FIG. 1, there is shown a prior art perspective view of a receptacle **100a** made from sheet metal which is currently welded onto receiving member **200a**, for example, an electrical cabinet faceplate. The prior art receptacle **100a** also contains cutouts **101a** through which EMI may pass.

As shown in FIG. 2, the present invention provides a receptacle **100** for an optic cable connector **300**. The fiber optic connector includes a fiber optic coupler (not shown) and fiber optic cables plugged into each side of the coupler. The receptacle **100** snaps into apertures **210** using protrusions **140** to lock the receptacle into place in receiving member **200**, which for example, may be an electrical cabinet faceplate.

Referring to the perspective view of receptacle **100** of FIG. 3, the connector receptacle **100** includes a connector receiving housing **120** having a cavity **160** (FIG. 2) therein for receiving the optic cable connector **300**. The housing **120** contains a plurality of surfaces including front surface **105**, right side surface **110** and a left side surface **115**.

Referring now to FIGS. 4 and 5, a protrusion **140** on each of the right and left side surfaces of the housing ends with an edge **150**. The protrusion **140** permits the receptacle housing to slide through the aperture **210** in receiving member **200**.

The protrusion **140** as shown in FIG 4A, conforms substantially with less than one-half of a conical or parabolic surface containing a top portion **141**, a middle portion **142** and a bottom portion **143**. The protrusion on each side of the housing permits the housing to slide through a first face of the receiving member **220** (FIG. 2) and a second face of the receiving member **230**. The protrusion **140** may also take on a wedge-shaped formation (not shown) that also permits the housing to slide into the receiving member.

The length of bottom portion **143**, designated in FIG. 4A as A, is

greater that the length of the top portion **141**, designated in FIG. 4A as B. As a result of this increase in length, the lateral surface area of each portion of the protrusion also increases in total respective surface area available to that portion of the protrusion. The increase in surface area begins with the top portion **141** of protrusion **140**, extends to the middle portion **142**, with the greatest increase in surface area appearing at the bottom portion **143**. This increase in surface area increases the spring force available to the housing upon insertion of the receptacle housing **120** into the receiving member **200**. As will be described more fully hereinafter, the nature of this force will allow the housing **120** to spring outwardly into place and to lock into the receiving member **200**.

Upon the insertion of the receptacle housing **120** into the receiving member **200** (FIG. 2), the sides of the housing **120** containing protrusions **140** collapse beginning at the top portion **141**, then extending to the middle portion **142**, and finally the collapse of the bottom portion **143**. At the end of bottom portion **143** is an edge **150**. When the housing **120** has been completely inserted within the receiving member **200**, the bottom portion **143** will spring outwardly and will cause firm impingement of edge **150** with the first face **220** of the receiving member **200**.

A lip **170** is also provided around the front side surface **105** of the receptacle housing **120**. A groove **190** (FIG. 4) is located above lip **170** and below edge **150**. The groove **190** extends at least the same length A, as indicated in FIG. 4A , as the length of the bottom portion **143** of protrusion **140**. The presence of groove **190** in the housing **120** enables the bottom portion **143** of protrusion **140** to slide completely through the first face **220** of the receiving member **200** before engaging the second face **230** of the receiving member **200**. This feature enables the housing **120** to become more effectively interlocked as a unit to receiving member **200** and for receiving the optic cable connector **300**.

As shown in FIG. 5, the lip **170** is provided around the front side

surface **105** of the receptacle housing **120**. The receptacle housing **120** is secured into apertures **210** in the receiving member **200** by the interaction of the lip **170** around the front side surface **105** and the edge **150** on the protrusion **140** (FIG. 2).

Referring again to FIG. 2, receiving member **200** may contain a multitude of apertures **210** that are provided for snapping in place connector receptacles **100**. The receiving member **200,** such as an electrical cabinet faceplate, contains the first face or front face **220** and the second face or back face **230**. The connector receptacle **100** snaps into place between the front face and the back face of the receiving member **200**.

The connector receptacle **100** of the present invention limits the bend radius of the fiber optic cable once it has been connected to the coupler because of the 45 degree angled passage **180** inside the cavity **160**. The passage **180** allows the end of the optic cable to pass through housing **120** and be electrically connected into its appropriate connection in receiving member **200**.

In addition, receptacle **100** is coated with a conductive material, for example, chrome or copper-nickel, and this coating provides a substantial improvement in the attenuation of emitted EMI.

In an example embodiment, receptacle **100** is an injection molded structure formed from a polymer-based compound. The polymer-based material is a polycarbonate material flexible enough to allow the right surface **110** and the left surface **115** to curve inward when sliding the receptacle housing **120** through the receiving member **200,** but also firm enough not to allow the surfaces **110, 115** to curve inwardly beyond the lip **170** on the front surface **105**, once the housing is in place.

In addition, the plurality of surfaces **105, 110, 115** and the cavity **160** in the front surface **105** thereof for receiving an optic cable connector **300** are coated with an electrically conductive material to provide EMI

shielding when the optic cable connector **300** is received within the cavity **160** of the receptacle housing.

Although the invention has been shown and described with respect to certain embodiments, it is obvious that equivalent alterations and modifications will occur to others skilled in the art upon reading and understanding of the specification. The present invention includes all such equivalent alterations and modifications, and is limited only by the scope of the claims.